Prevalence of Insomnia Complaints and its Consequences in Kuwaiti College Students

Ahmed M. Abdel-Khalek, Ph.D.

Objective: To estimate the prevalence rates of, and gender differences in insomnia complaints and its consequences, as well as to assess the reliability and validity of the Insomnia Scale.
Method: 2,210 male and female non-clinical Kuwaiti college students participated. Their ages ranged from 16 to 37. Insomnia scale (IS) comprising 12 items was administered in group sessions. Point prevalence rate was computed as the summation of the percentages of responses in the two options "Much" and "Very much" on each item during the most recent month.
Results: The IS has acceptable test-retest and alpha reliabilities, and good convergent validity. The prevalence of the 12 IS items ranged from 4.1% to 29% in males, and between 4.8 and 32.2% among females. The highest reported insomnia complaint was early morning awakening in both sexes. It was found that 19.4% of males and 18.1% of females reported difficulty initiating sleep, while 8.6% of males and 15.7% of females reported difficulty maintaining sleep. Females have higher mean scores in 3 items: interrupted sleep, awakening up many times during sleep, and annoyance from interrupted sleep.
Conclusion: Point prevalence of insomnia and its consequences among the present sample of Kuwaiti undergraduates lies approximately in the range of previous epidemiological studies. However, the present range is somewhat lower than that of Kuwaiti adolescents. It is useful to administer the same assessment tool in the epidemiology of sleep disorders research. **(Sleep and Hypnosis 2006;8(2):54-60)**

Key words: Insomnia complaints, epidemiology, prevalence, college students, Kuwait

INTRODUCTION

Insomnia may have grave consequences on work and health (1-3). A host of research papers has estimated the prevalence rates of insomnia, mainly in Western countries. Ohayon and Guilleminault (4) presented prevalence rates of insomnia symptoms in the general population of America, Western Europe, and Australia (4, Table 20-1, p. 303f). These rates ranged among males and females between 5.1% and 48.0%. However, other studies have reported a range from 10% to 40% (5-7). More recently, Ohayon and Lemonie (8) stated that the prevalence rate of insomnia in industrialized countries ranges between 10% and 48%.

Acknowledgement: The present research was supported by Kuwait University under Grant No. OP01/04. The author gratefully acknowledges the generous assistance of Research Administration at that University. I thank Professor Eugene Steele, Department of English, College of Arts, Kuwait University for his assistance in proofing the manuscript.

Address reprint requests to: Dr. Ahmed M. Abdel-Khalek
Department of Psychology, Kuwait University, P. O. Box 68168 Kaifan, Code No. 71962, Kuwait, Email: ahmedkuniv@hotmail.com

Accepted April 27, 2006

It is particularly noteworthy that the vast majority of the published studies on insomnia were carried out on participants from Western countries. Few previous studies have examined non-Western participants, including the Arab populations. In Kuwait, Abdel-Khalek (9) conducted an epidemiologic study of sleep disorders in non-institutionalized secondary school students (N=2,574) to assess prevalence of complaints of insomnia, hypersomnia, nightmare, sleep-walking, sleep terror, and narcolepsy. This sample ranged from 14 to 18 in age. The point prevalence on all the items ranged from 1% to 37.5%. However, that research was not devoted solely to the study of insomnia complaints, which was assessed by only four indicators. The reported prevalence rates ("Much"+"Very much") for boys and girls, respectively were as follows: difficulty initiating sleep (DIS) (14.5%; 20.5%), fitful and disturbed sleep (8.8%; 15.8%), waking up several times (9.5%; 15.2%) and insufficient sleep (35.2%; 37.5%).

More recently, Abdel-Khalek (10) constructed the Insomnia Scale (IS) and administered it to 5,044 Kuwaiti adolescents. It was found that the prevalence of the 12 IS items ranged from 6.4% to 31.7% in boys, and between 6.5% and 35.9% among girls. The highest reported insomnia complaint was early morning awakenings (EMA), i.e., 31.7% in boys, and 35.9% in girls. It was found also that 14.6% of boys and 20.3% of girls reported DIS, while 8.6% of boys and 15.7% of girls reported difficulty maintaining sleep (DMS). Girls have higher mean scores than their boy counterparts in most of the IS items. This author concluded that there is a need to agree upon the methodology, especially the assessment tool, for an epidemiology of sleep complaint research.

To fulfill this goal, insomnia was ascertained using the Insomnia Scale (IS) developed by Abdel-Khalek in Kuwait (10). This common methodology provides the basis for comparative analyses of the epidemiology of insomnia complaints in the Arabic-speaking populations. Based on both the few studies on insomnia among Arab population, and the probable negative impact of insomnia on university students in this critical and important stage of life, the current investigation has carried out. It is particularly worth mentioning that the present study deals with insomnia complaints and not insomnia as a disorder or syndrome.

The aims of the current investigation, using a Kuwaiti sample of undergraduates, were three-fold: (1) to assess the reliability and validity of the IS, (2) to estimate the prevalence rates of insomnia complaints and its consequences, and (3) to explore the sex-related differences of insomnia and its consequences.

MATERIAL AND METHODS

Participants

A convenient sample of 2,210 volunteer males (*n*=1,056) and females (*n*=1,154) were selected from various colleges at Kuwait University. All of them were Kuwaiti undergraduates. This sample represented 14.7% of the Kuwaiti student population. Their ages ranged from 16 to 37 years. The mean age of the males was 20.17%±2.54 years, while that for the females was 19.97±2.31 years. These participants, as a whole, were neither disturbed clinical cases nor diagnosed institutionalized patients, but rather, were presumably healthy young adults. However, no psychiatric assessment conducted to support that these students had not mental illness.

The Insomnia Scale (IS)

The IS was constructed in both Arabic and English by Abdel-Khalek (10). It comprised 12 items. Participants were requested to respond to each item on a 5-point scale as follows; 0: No, 1: A little, 2: Moderate, 3:

Much, and 4: Very much. They were instructed to answer the IS items according to their subjective evaluation, on the basis of their perceived severity during the past month. The IS enjoys good psychometric properties as it applied to Kuwaiti secondary school students (10), as well as the present sample (see Table 1).

Procedure

The Insomnia Scale, along with other questionnaires, was administered to participants in group sessions of approximately 40 students in their classrooms, during regular university hours. The scales were administered to each group in a single session of around 20 minutes. The students provided verbal consent for participation, after the aims of the study were outlined. There were no refusals. However, some incomplete sheets were excluded. No compensation for the students' participation in the study was offered. Assurances were made that anonymity would be maintained. The present investigation was carried out in the year 2004.

Point prevalence rate was defined as the proportion of participants who complained of a given symptom at a specific time (10-12). Therefore, the point prevalence was computed for each item separately, and the summation of the percentage of responses in the last two options, 3 and 4 (i.e. "Much" and "Very much") was combined to denote the highest frequency of the phenomenon in question during the previous month. This procedure is consistent with previous studies which considered the selection of the options "Always" or "Often" as an indication that the subject has the problem (6,7,9,13).

RESULTS

Table 1 presents the 1-week interval test retest reliability for each item of the IS. These coefficients ranged between 0.57 and 0.92. The item-remainder correlations ranged from 0.32 to 0.67 (all $p < .01$ and above). For the total 12 scale items, the test-retest reliabilities were 0.81 and 0.83, and that for Cronbach alpha were 0.84 and 0.87 for males and females respectively, showing good temporal stability and internal consistency. The Arabic Sleep Disorders Scale (14) and the Sleep Questionnaire by Jenkins and his colleagues (15) were used as criteria for the IS. Table 1 shows that all the correlations between the IS individual items and the two criteria were statistically significant and ranged from 0.33 to 0.88. This result displays good convergent validity of the IS in college students.

Table 1. One-Week Test-Retest, Cronbach α Reliability, Item-Remainder Correlation, and Convergent Validity of the Insomnia Scale

	Retest Reliability		Item-Remainder r		Validity**	
Item No.*	Males N=70	Females N=71	Males N=200	Females N=200	C1† N=60	C2‡ N=65
1	.73	.80	.49	.54	.77	.64
2	.71	.79	.59	.66	.88	.79
3	.82	.72	.48	.54	.83	.76
4	.60	.68	.32	.42	.55	.50
5	.62	.84	.41	.47	.71	.43
6	.57	.79	.49	.52	.76	.56
7	.65	.69	.56	.60	.70	.58
8	.77	.92	.62	.67	.67	.54
9	.78	.72	.55	.61	.71	.51
10	.73	.71	.58	.59	.69	.59
11	.61	.68	.48	.52	.52	.33
12	.68	.66	.51	.48	.60	.56
Total Score					.94	.76
Retest	.81	.83				
α	.84	.87				

*See the items in Table 2., **All $p < .01$ and above, 2-tailed, †C1 = Criterion 1: The Arabic Sleep Disorders Scale., ‡C2 = Criterion 2: The Sleep Questionnaire.

Inspection of Table 2 shows that the percentage of response options 3 plus 4 (i.e., "Much and Very much") among males ranged from 4.1 % (Item No. 5) to 29% (item No. 4). Among females, the percentage of response alternatives 3 plus 4 ranged between 4.8% (item No. 5) and 32.2% (item No. 4). Figure 1 presents the percentages of insomnia and its consequences in males and females.

On the basis of the *t* ratio, females have significantly (p<.0001) higher mean scores than their male counterparts only on 3 items, i.e., No. 2: "My sleep is interrupted and disturbed" (t= 5.27), No. 3: "I wake up many times during my sleep" (t= 4.77), and No. 10: "My interrupted sleep annoys me" (t= 4.18).

Table 2. Percentages of Respondents by Response Options for Insomnia Scale Items

The Insomnia Scale (IS) items	Males (N=1,056)			Females (N=1,154)		
	Much	Very Much		Much	Very Much	
	3	4	3+4	3	4	3+4
1. I find it difficult to get to sleep.	12.4	7.0	19.4	13.6	4.5	18.1
2. My sleep is interrupted and disturbed.	6.8	2.8	9.6	10.9	3.5	14.4
3. I wake up many times during my sleep.	6.4	1.9	8.3	11.6	2.2	13.8
4. I wake up early in the morning before getting enough sleep.	21.5	7.5	29.0	23.4	8.8	32.2
5. I feel depressed when it is time for me to go to bed.	2.7	1.4	4.1	3.1	1.7	4.8
6. Before I fall asleep I have bad thoughts.	14.3	8.1	22.4	14.4	9.0	23.4
7. I feel tired when I wake up.	18.2	5.8	24.0	17.6	5.9	23.5
8. I normally wake up in a bad mood.	8.1	3.6	11.7	8.4	3.0	11.4
9. I get tense when I wake up.	8.8	2.9	11.7	8.3	3.6	11.9
10. My interrupted sleep annoys me.	14.0	4.4	18.4	17.7	7.0	24.7
11. My Interrupted sleep affects my relationship with others.	7.5	1.4	8.9	5.2	2.5	7.7
12. My interrupted sleep affects my work performance.	11.7	3.3	15.0	10.9	2.7	13.6

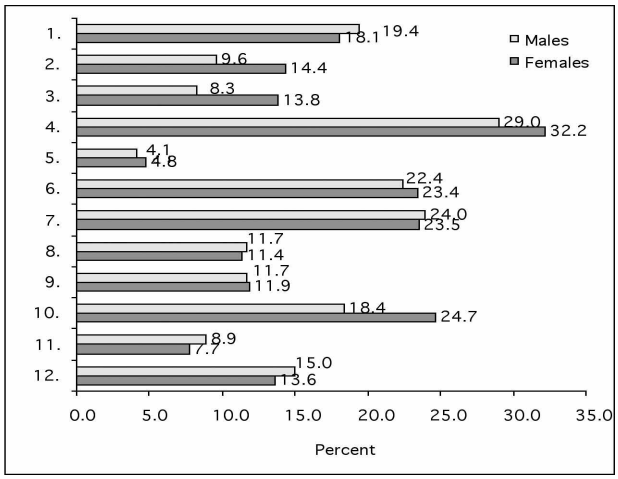

Figure 1. Percentage of reported insomnia complaints and consequences among males and females (Much + Very much)

By and large, the main insomnia complaints, among males and females, respectively were, as follows: DIS: 19.4% and 18.1% (item No. 1); DMS: 8.3% and 13.8%; (item No. 3, p<.0001); Interrupted and disturbed sleep: 9.6% and 14.4% (item No. 2, p<.0001); and EMA: 29% and 32.2% (item No. 4).

DISCUSSION

It is important to note that the Insomnia Scale (IS) has shown itself as a good psychometric instrument. That is, it has good temporal stability, internal consistency, and convergent validity (2 criteria). The present findings are congruent with previous results with Kuwaiti adolescents (10) in which the IS manifested good psychometric properties.

Point prevalence, or the percentages of students complaining of different indicators of insomnia and its consequences (the summation of alternatives: "Much" and "Very much"), ranged from 4.1% to 32.2%. This range lies approximately in prevalence ranges reached by different previous epidemiological studies (4-7). However, the present point prevalence range of insomnia complaints and its consequences among Kuwaiti undergraduates is lower than that range which has been estimated among

Kuwaiti adolescents, i.e., from 6.4% to 35.9% (10).

Because the IS was used on both the present study among undergraduates and previous one carried out in a large sample (*N*=5,044) of adolescents, both are Kuwaiti participants, the comparison being viable. By and large, the differences between the male adolescents and undergraduates were not large. However, the differences between the female adolescents and undergraduates were very sharp; in which female adolescents reached higher mean scores than their female undergraduate peers on 10 out of the 12 IS items. The last difference may be elucidated in the light of the critical and sensitive position of female Kuwaiti adolescents in proportion to their female peers in the early adulthood. On adolescence, the physical and psychological changes do interact with the social restrictions and the pressures of the study on the secondary school. Among young adults, on the other hand, these changes have been stopped, and the restrictions and pressures are ameliorated. This interpretation did not apply to male adolescents and young adults because the differences between these two developmental stages among males as to restrictions and stresses are not sharp as in females.

Notwithstanding the specific gender-related differences, the highest reported complaint in males and females was on EMA, i.e., item No. 4: "I wake up early in the morning before getting enough sleep" (29% in males, and 32.2% in females). This finding could be seen as a manifestation of the stresses of study, in addition to the general stresses of life. It is worth mentioning that some female students are married, while some of male students are employed, in addition to their marriage. In these cases, study, marriage and work may impose more stresses on those students. Although the variables of social status and employment were not assessed in the present study, on the basis of the experience of the present researcher as a professor in this university, both these cases and stresses do exist.

It is particularly noteworthy that the highest reported complaint in the present sample of college students was on EMA. This finding was compatible with a previous result on adolescents (10). Both samples were Kuwaiti participants. Almost every other epidemiological study of insomnia find that frequent or prolonged awakenings are far more common than EMA (2,5,6). This result on Kuwaiti participants could be elucidated on the light of their life style. That is, most of them sleep late at night. Therefore, they wake up before getting enough sleep. However, this point needs further research.

On the other hand, the lowest reported complaint among both males and females was on item No. 5: "I feel depressed when it is time for me to go to bed" (4.1% and 4.8% in males and females, respectively). It is suitable to hypothesize that this item tap a complaint more prevalent in psychopathological cases, in which some patients develop a form of anxiety which may lead to depression associated with going to sleep. Then, "their struggle to fall asleep and their anxiety about possible daytime fatigue set up a conditioned association between bedtime behavior and anxious arousal". (16, p. 836). However, the participants in the present study were presumably healthy individuals.

Based on the summation of 2 responses ("Much" + "Very much") of the present sample of Kuwaiti undergraduates, females reached higher mean scores than their male peers in 9 out of the 12 IS items, regardless of the significance level, but 3 items only reached the significant level. Therefore, it could be concluded that females had significantly higher mean scores than their male counterparts in these salient insomnia complaints. A wide harvest of previous results supported the present finding. (10,17-21). This result is compatible with the higher mean scores of females than males on

anxiety, depression, fear, neuroticism, and pessimism in Arab respondents (22-26). In the same vein, Krystal (27) stated that insomnia occurs more frequently in women than men. An important contributing factor is that insomnia complaint can occur in association with hormonal changes that are unique to women. Furthermore, women are more likely to suffer from major depression and anxiety disorders, which are also associated with insomnia.

Following a similar pattern, it is interesting to note that females had significantly higher mean scores than males on two items related to interrupted sleep and its consequence, i.e., item No. 2: "My sleep is interrupted and disturbed", and item No. 10: "My interrupted sleep annoys me".

There are several limitations in the current study. Despite the large size of the present sample and its good representativeness of the whole population (14.7%), it was a university-based survey carried out on a limited age range. An important next step in this project, and a question for further investigation, would be to choose a probability sample of the whole Kuwaiti population.

REFERENCES

1. *Linton SJ, Bryngelsson IL. Insomnia and its relationship to work and health in a working age population. Journal of Occupational Rehabilitation 2000;10:169-183.*

2. *Roth T, Ancoli – Israel S. Daytime consequences and correlates of insomnia in the United States: results of the 1991 National Sleep Foundation Survey II. Sleep 1999; 22 (Suppl. 2):354–358.*

3. *Leger D, Guilleminault C, Bader G, Levy E, Paillard M. Medical and socio-professional impact of insomnia. Sleep 2002;25:625-629.*

4. *Ohayon M M, Guilleminault C. Epidemiology of sleep disorders. In Chokroverty S, Daroff R B, eds. Sleep disorders medicine: basic science, technical considerations, and clinical aspects, 2nd ed., Boston: Butterworth & Heinemann; 1999:301-316.*

5. *Ancoli-Israel S, Roth T. Characteristics of insomnia in the United States: results of the 1991 National Sleep Foundation Survey I. Sleep 1999;22 (Suppl. 2):347-353.*

6. *Simon G E, Vonkorff M. Prevalence, burden, and treatment of insomnia in primary care. American Journal of Psychiatry 1997; 154:1417-1423.*

7. *Liu X, Uchiyama M, Kim K, Okawa M, Shibui K, Kudo Y, Doi Y, Minowa M, Ogihara R. Sleep loss and daytime sleepiness in the general adult population of Japan. Psychiatry Research 2000;93:1-11.*

8. *Ohayon M M, Lemoine P. A connection between insomnia and psychiatric disorders in the French general population. Encephale 2002;28:420-428.*

9. *Abdel-Khalek AM. Epidemiologic study of sleep disorders in Kuwaiti adolescents. Perceptual & Motor Skills 2001;93:901-910.*

10. *Abdel-Khalek AM. Prevalence of reported insomnia and its consequences in a survey of 5,044 adolescents in Kuwait. Sleep 2004;27: 726-731.*

11. *Burke JD, Regier DA. Epidemiology of mental disorders. In: Hales, RE, Yudofsky SC, Talbott JA, eds. The American psychiatric press textbook of psychiatry. 2nd ed. Washington DC: American Psychiatric Press; 1994:81-104.*

12. *Streiner DL. Let me count the ways: measuring incidence, prevalence, and impact in epidemiological studies. Canadian Journal of Psychiatry 1998;43:173-179.*

13. *Foley DJ, Monjan AA, Brown SL, Simonsick EM, Wallace RB, Blazer DG. Sleep complaints among elderly persons: an epidemiologic study of three communities. Sleep 1995;18:425-432.*

14. *Abdel-Khalek AM, El-Nayal MA. Sleep disorder and its relation to depression, anxiety, and obsession. The 8th Conference of Psychology in Egypt, held in June 6-8, 1992:112-128.*

15. *Jenkins CD, Stanton BA, Niemcryk SJ, Rose RM. A scale for the estimation of sleep problems in clinical research. Journal of Clinical Epidemiology 1988;41:313-321.*

16. *Neylan TC, Reynolds III CF, Kupfer DJ. Sleep disorders. In: Hales RE, Yudofsky SC, Talbott JA, eds. The American psychiatric press textbook of psychiatry, 2nd ed. Washington, DC: APA; 1994:833-855.*

17. *Bixler EO, Vgontzas AN, Lin HM, Vela-Bueno AV, Kales A. Insomnia in central Pennsylvania. Journal of Psychosomatic Research 2002;53:589-592.*

18. *Chevalier H, Los F, Boichut D, Bianchi M, Nutt D J, Hajak G, Hetta J, Hoffmann G, Crowe C. Evaluation of severe insomnia in the general population: results of a European multinational survey. Journal of Psychopharmacology 1999;13(4, Suppl. 1):S21-S24.*

19. *Ohayon MM. Prevalence of DSM-IV diagnostic criteria of insomnia: distinguishing insomnia related to mental disorders from sleep disorders. Journal of Psychiatric Research 1997;31:333-346.*

20. *Sutton D A, Moldofsky H, Badley E M. Insomnia and health problems in Canadians. Sleep and Hypnosis 2001;24: 665-670.*

21. *Li RHY, Wing YK, Ho SC, Fong SYY. Gender differences in insomnia – a study in the Hong Kong Chinese population. Journal of Psychosomatic Research 2002;53:601-609.*

22. *Abdel-Khalek AM. Normative results on the Arabic Fear Survey Schedule III. Journal of Behavior Therapy and Experimental Psychiatry 1994;25:61-67.*

23. *Abdel-Khalek AM. The Kuwait University Anxiety Scale: psychometric properties. Psychological Reports 2000; 87: 478-492.*

24. *Abdel-Khalek AM, Eysenck SBG. A cross-cultural study of personality: Egypt and England. Research in Behavior and Personality 1983;3: 215-226.*

25. *Abdel-Khalek AM, Lester D. Optimism and pessimism in Kuwaiti and American college students. International Journal of Social Psychiatry, 2006;52:110-126.*

26. *Abdel-Khalek AM, Alansari BM. Gender differences in anxiety among undergraduates from ten Arab countries. Journal of Social Behavior and Personality, 2004; 32:649-655.*

27. *Krystal AD. Insomnia in women. Clinical Cornerstone 2003;5:41-50.*